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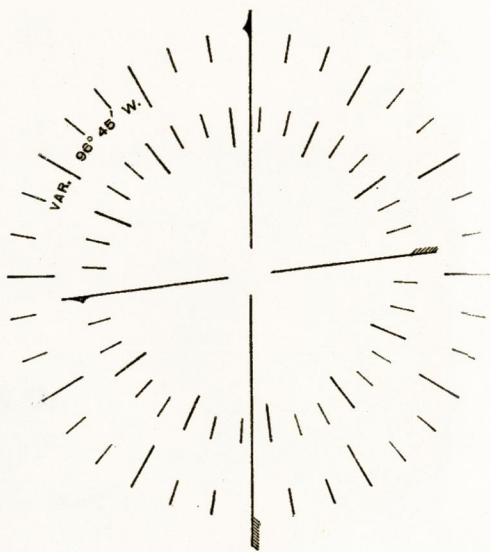
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IRIS K. JESUP GL.



From

Lat.



SOUND

MAP OF WHALE SOUND GREENLAND

From Surveys by Civil Engineer, R. E. Peary, U.S.N.

Assisted by Hugh J. Lee

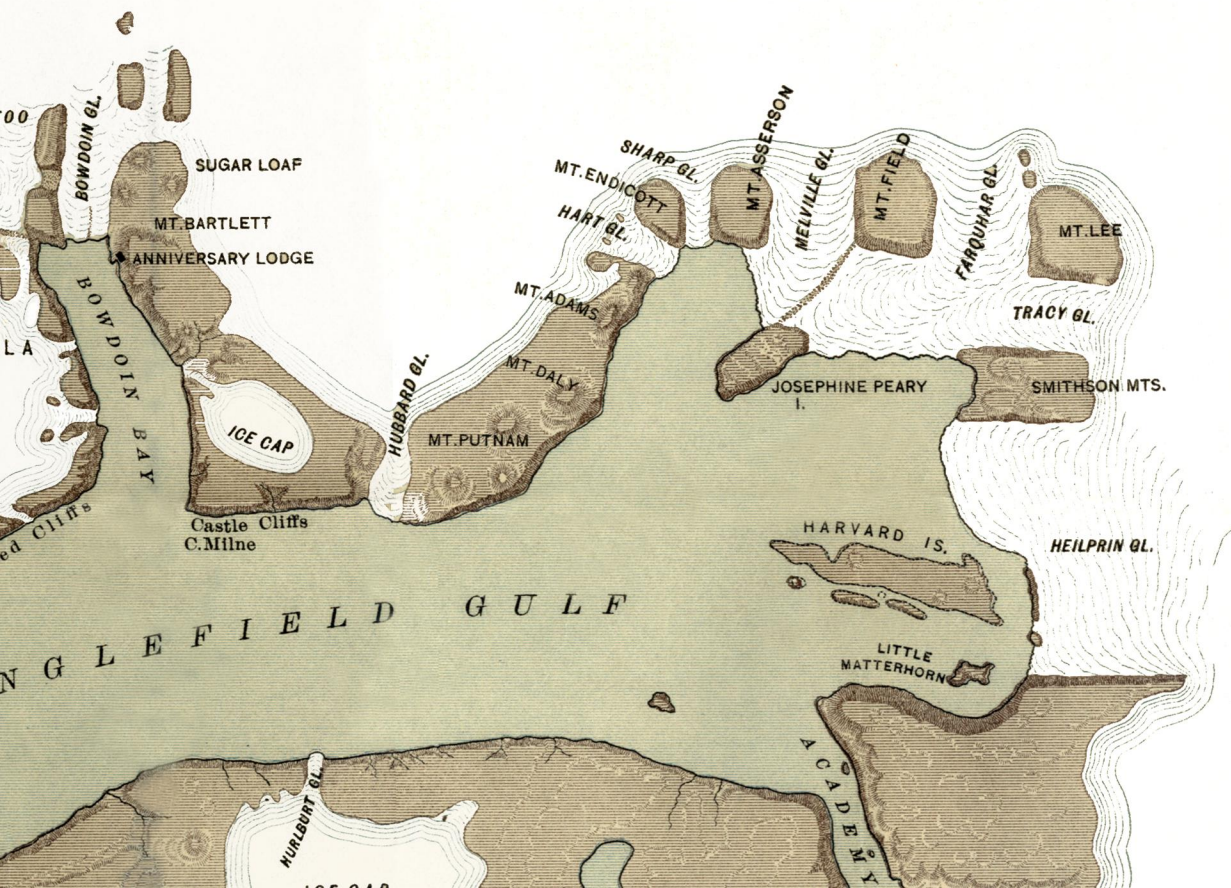
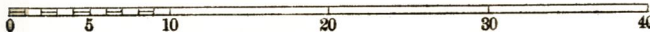
1894-'95.

Lat. of Lodge 77° 41' 23" N. Long. of Lodge 68° 40' W.

SCALE OF MILES



SCALE OF KILOMETERS



Cape Chalon

CLEMEN

DIEBITSCH GL.

MORRIS K. JESUP GL.

MEEHAN GL.

VERHOE

Cape Robertson

ROBERTSON BAY

MT. WISTAR

ICE CAP

OMENAK
SOUND
MURCHISON

MC CORMICK B

Redcliffe

Cape Cleveland

R
FAN

Josephine
Headland

KISSEL GL.

PARRISH GL.

ROBBINS GL.

HAKLUYT I.

NORTHUMBERLAND I.
ICE CAP

C. Lee

ICE CAP

HERBERT I.

Bastion Pt.

C. Henson

WHALE
SOUND

C. Trautwine

C. Powlett

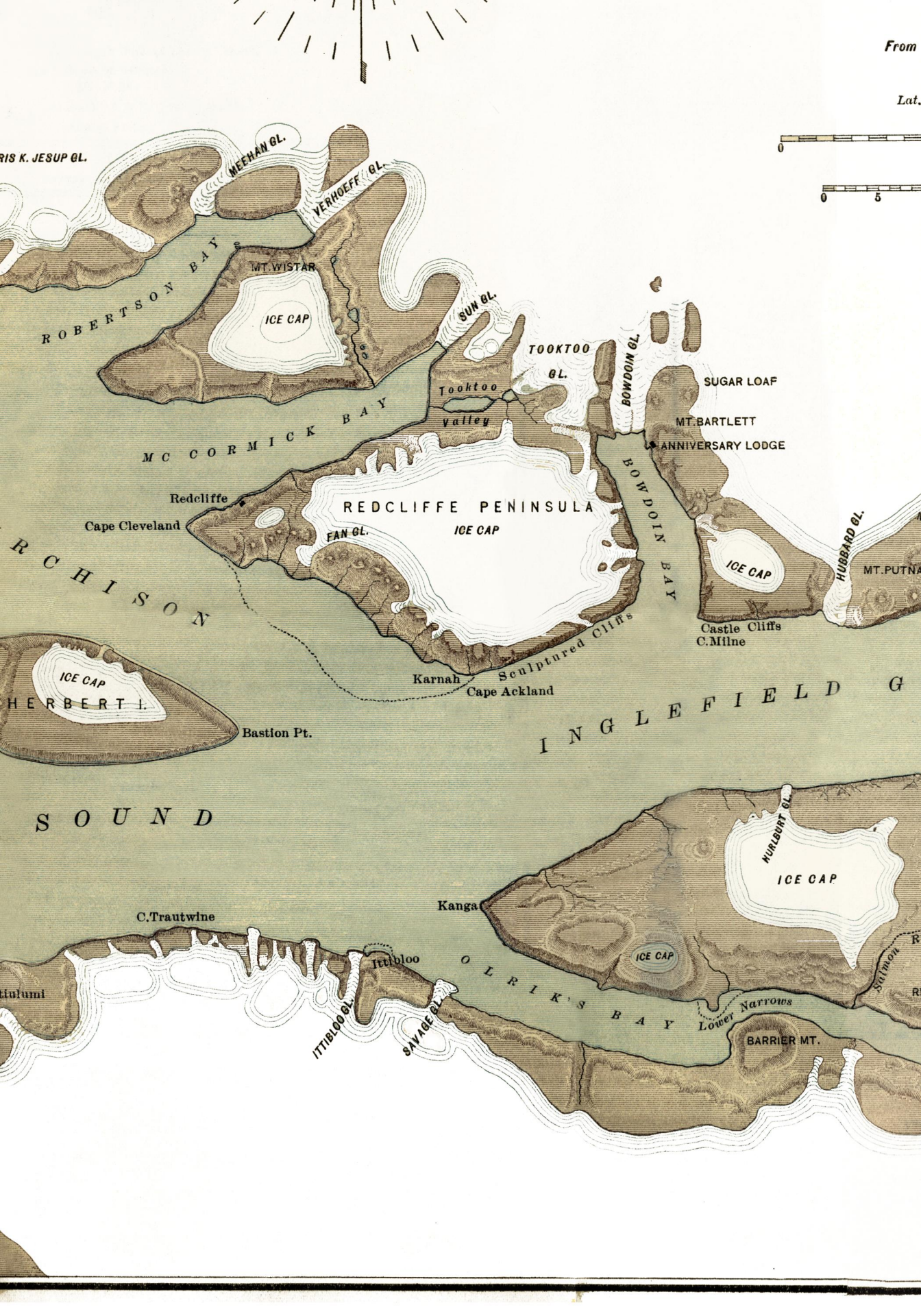
BARDEN BAY

Netilutumi

TYNDALL GL.

ITTIBLOO GL.

Cape Parry



GREENLAND

From Surveys by Civil Engineer, R. E. Peary, U.S.N.

Assisted by Hugh J. Lee

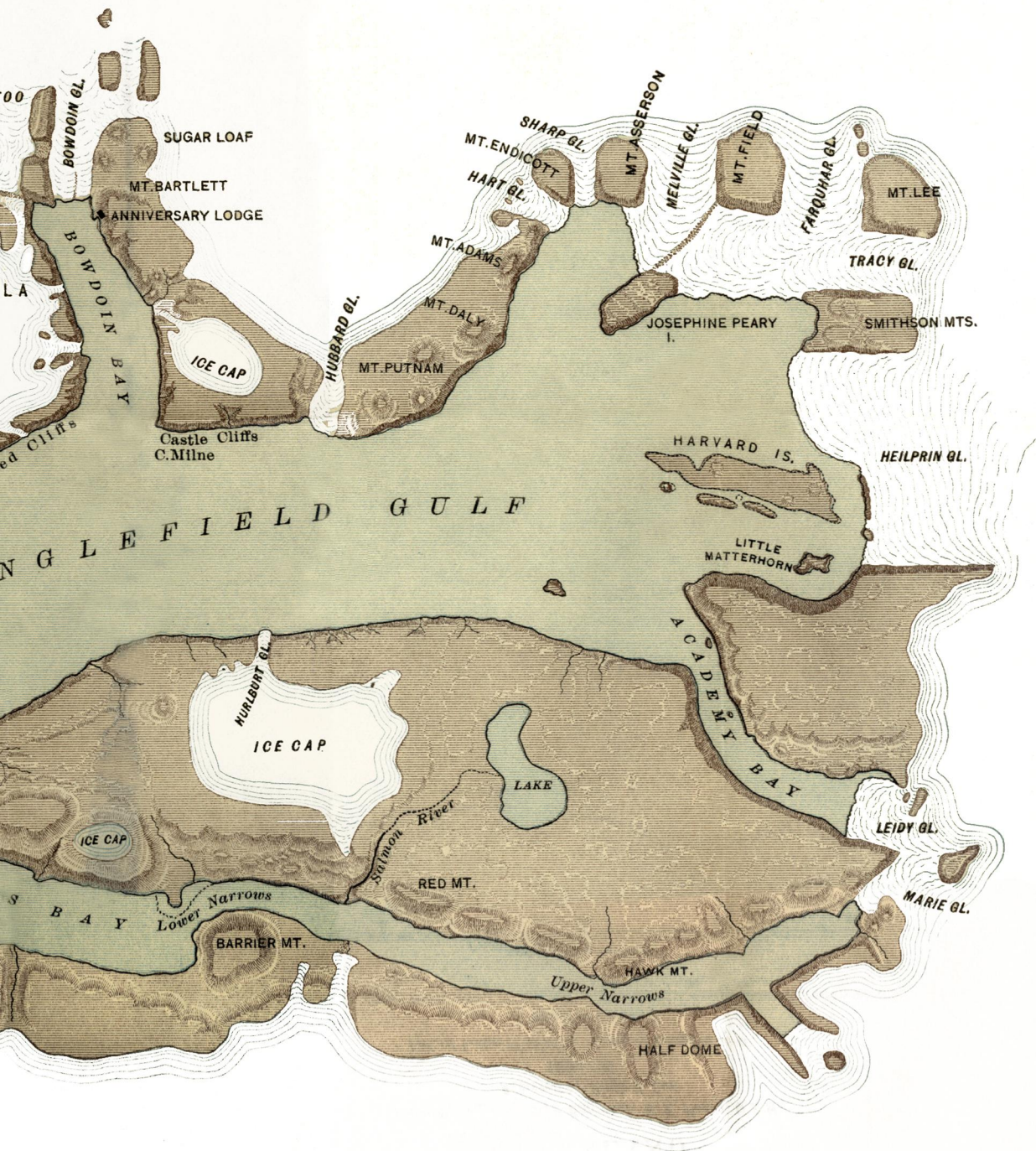
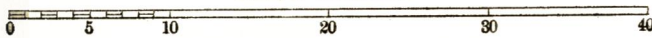
1894-'95.

Lat. of Lodge $77^{\circ}41'23''$ N. Long. of Lodge $68^{\circ}40'$ W.

SCALE OF MILES



SCALE OF KILOMETERS



WORK IN NORTH GREENLAND IN 1894 AND 1895.

CIVIL ENGINEER R. E. PEARY, U.S.N.

When on the 28th of August, 1894, I pulled away in my whale-boat from the side of the ill-fated whaler *Falcon* lying to in Smith Sound off the Petowik Glacier, my feelings were not of the cheeriest, yet I had no reason to think that my chances of carrying out my cherished plans were, barring unavoidable accidents, other than good. Though the *Falcon* was separating me from those near and dear to me she was carrying them to safety and comfort, and she was leaving me with a small but experienced, effective, homogeneous and loyal party.

In the boat with me were one of my companions, Henson, and five of my faithful, trusty Eskimo allies, dusky children of the north. Nearly two hundred miles north, at the Lodge, at the head of Bowdoin Bay, was my other companion, brave, loyal Lee, awaiting my return. At the Lodge with him was an ample supply of all the essentials of life, except meat, requisite to carry us through the winter and early spring. Cached on the "great ice," at various distances of from twenty-six to one hundred and twenty-eight miles from the Lodge, were all (except a few minor) supplies needed for the white march across the "great ice" the following spring and summer.

My general programme was, as soon as I could have regained the Lodge, to proceed with some of my native allies to the deer pastures of Kangerdlooksoah and draw upon them for our own meat supply for the coming winter; then to levy tribute on the walrus at their feeding grounds in Omenah Sound for my winter supply of dog food. After that I would visit those of the caches upon the "great ice" located within a distance of fifty miles from the Lodge, dig them out, re-arrange them again upon the surface of the snow, and re-erect any signals that might have been broken off or blown down by the wind.

I should then endeavor to pass the winter leisurely working upon our equipment for the long sledge journey; exercising the utmost care to keep ourselves in physical condition, and conserving every energy, physical and mental, for a fight to the finish, when once again we attacked the "great ice."

All the time I recognized two eventualities which might defeat

everything. The first was the breaking out of the Pibloktoo or epidemic dog madness among the native dogs, which, if the attack were serious, might almost exterminate the animals of the tribe and render it impossible for me to obtain dogs for the journey across the ice-cap. Second, the arrival of that end, which in the words of brave Horatius, of that other dauntless three, comes to each man soon or late.

I place the latter possibility second intentionally because without dogs it would be folly to think of attempting the conquest of the "great ice," while the reduction of our number to two would not necessarily mean the same. The journey to Independence Bay had once before been made by two, and there seemed no reason why it should not be made by two again.

As I stood in the stern sheets of my boat looking at the *Falcon*, her propeller began again its monotonous song, she swung on her keel, gradually gathered headway, and, threading her way among the bergs and floes, disappeared in the ice of the southern horizon.

Turning in the opposite direction, northward, toward the gloom of the coming Arctic night, for which my boat was heading, my eyes rested upon my Eskimo crew, pulling with all the strength of their iron-muscle backs, for the shelter of the bleak rocks of Cape Athol. A strange, wild, fur-clad crew, with dirty, greasy faces and coarse, matted hair, yet sturdy and faithful.

The brief Arctic summer was at an end and the lifeless gray sky hanging low over the icy waves of the North Water, and the black snow-capped cliffs of the iron-bound shore, made my crew as anxious as myself to reach the Lodge at the earliest possible moment, and lessen the chance of being caught in one of the violent storms which frequently mark this season of the Arctic year.

It was a curious coincidence that forty years (less half an hour) before, the "boat party" had left the *Advance* in Rensselaer Harbor in an attempt to reach Upernavik. That party was bound south, I was bound north, and the coincidence was more strongly accentuated by the fact that my first landing, twenty hours after separating from the *Falcon*, was at the place where that party had been stopped by the ice, and where they were obliged to build a small stone shelter in which they lived some three months until forced by starvation to retreat to the ship. In these twenty hours we passed the only critical part of our voyage, the wide and usually wind-swept mouth of Wolstenholm Sound, which, with its floating ice and tidal currents, would under unfavorable circumstances have been a very disagreeable stretch of navigation. Fortunately it was

very calm at the time we crossed, and we reached and pulled along the "Land of Noogli," with the heavy north-water swell breaking in foaming thunder upon its low iron shore. From here I continued my voyage northward, and rounding the frowning black cliff of Cape Parry (Kangahsuh, the "Great Cape" of the natives,) entered Whale Sound, then coasted along the southern shore of this Sound into the river-like reaches of Oloriks Bay to the deer pastures near its head to obtain some venison. The shelter of this bay was reached just in time to escape a violent southeaster which came rushing down from the frozen heart of the "great ice," swept over the crests of the cliffs in a blinding cataract of drifting snow, that mingled with the sheets of white spray torn from the water, till the entire Bay from water to mountain summit was a roaring, surging Arctic inferno. Nine days after leaving the *Falcon* I reached the Lodge.

The new ice was now rapidly forming in every place where the water was not constantly agitated by the wind, and it was only after the most arduous efforts that I got my boat within five miles of Falcon Harbor, where it was hauled out, and we walked overland to the Lodge.

There was no time to lose, and in twenty hours after our arrival Henson was on his way with the Eskimos to Kangerdlooksoah for deer.

Immediately upon his return Lee and myself started for the walrus grounds, where I harpooned and secured seven of these animals, and on the last day of September the final load of this meat and blubber and all our venison was safely housed. Space does not permit a description in detail of these walrus hunts. Any one in search of the excitement of bagging big game, will find it in the superlative degree in harpooning walrus. The setting of the scene is savage in the extreme: the barren snow-covered shores, tenfold more dismal and desolate in the sombre twilight of the Arctic autumn, the dead white, ghastly ice floes and spectral bergs driven here and there by winds and currents, and the black water swirling between. To creep among these bergs upon a herd of walrus stretched upon an ice pan, and as the huge half-frightened, half-enraged brutes plunge for the water, to spring to one's full height and with a motion that calls every muscle from toe to neck into play, hurl the flying harpoon at the nearest, then throw the coils of line over board as the harpoon quivers in the armor-like hide, will string the nerves to such a pitch of intensity, that when a moment later the sinuous, flexible harpoon line, the end of which is fast-

ened to an iron bolt in the bow of the boat, becomes a vibrant rod of steel singing like a great æolian, and the boat, with the foam hissing from her bows, goes tearing wildly through the ice in tow of the great maddened brute, every fibre of one's body will be in unison with the singing line.

The next event was the search for the caches of provisions which I had left up on the inland ice the previous spring. Had it not been imperative that I should first assure my winter's meat supply for both men and dogs, I should have searched for these caches immediately after my return from the ship; but there had been no alternative left me. Now, was the first opportunity. With Matt, one of the young Eskimo men who rejoiced in the name of Mak-sangwah, but who was more familiarly known as "Flaherty," and ten of my best dogs, I started to accomplish this work. It was very late in the season now; we had but a few hours of daylight, and work upon the ice-cap could be prosecuted only under serious disadvantages. The first day's march on the "great ice" was, however, satisfactory, and I camped at night with sanguine hopes of finding my caches on the following day. The next day we reached the site of my first cache, but before we could begin the search for it it began snowing with every indication of one of the severe south-easters which characterize the beginning of the long Arctic night in this latitude.

So discouraging were the atmospheric prophecies to my Eskimo companion, "Flaherty," that after the tent was pitched and while Matt and myself were inside arranging the sleeping bags and putting the cooking apparatus in commission for our supper, he seized the opportunity to beat a retreat for the Lodge. Though very much irritated at the moment, I was afterwards glad that he left us when he did. Poor fellow, I learned afterwards that it took him four days to reach the Lodge, arriving at the end of that time so weak with hunger and cold that he could barely crawl.

As for ourselves, after making every preparation for the protracted storm, which long experience on the "great ice" told me was now upon us, Matt and myself turned in.

Reluctantly I resigned myself to the inevitable prospect of another of these dreary storm-bound episodes upon the "great ice"; only hoping that I might be as fortunate as hitherto in sleeping away the majority of the long hours. All night and during the next day the monotonous music of the storm continued. Late in the afternoon the wind slackened a little, enabling us to get out of the tent, feed and untangle the dogs, and muzzle several suspicious

characters that might be expected under the influence of that arch devil of mischief and destruction which in storms on the "great ice" possesses the Eskimo dog, to chew up harnesses, traces and each other.

Then another and another and another similar night till six weary gnawing nights and days, the most accursed I ever spent upon the "great ice," had crawled their slow lengths into the past. At last came the cessation of the storm and hastily digging out tent and sledge from the drift, we harnessed up the dogs and began the search for the caches.

I feared from the first that this search would be unavailing, for during the six days' storm, over three feet of snow on the level had fallen. Yet through every minute of the precious daylight we diligently quartered the surface of the desert of snow, straining our eyes in the effort to detect a bit of the poles which had been left to mark the position of the caches, still projecting above the snow.

All our efforts were in vain. All of my essential supplies for the coming sledge trip, a total of nearly a ton and a half of provisions, had been swallowed up beyond recovery by the insatiable ice-cap. I was almost stunned by my loss; I felt like a man shipwrecked upon an uninhabited shore with nothing left him but the clothes upon his back. With the return from the ice-cap in this pleasant frame of mind began the long winter night. While on the ice-cap 6,000 feet above the level we had several hours of daylight; down at the Lodge at the sea-level under the shadow of the mountains, the duration of daylight at noon was but an hour or two. We were already on the confines of the valley of the shadow of death; the great, the indescribable night of the Arctic.

With the commencement of the Arctic night begins the monotonous hum-drum house life of the Arctic explorer. The hardest, and even under the most favorable circumstances, dreariest time of all for him. We entered its gloomy depths under doubly unpleasant conditions.

The loss of my caches had been a blow which dazed me for a time. We had been badly enough off before in regard to equipment, having only odds and ends and wreckage, so to speak, from which to evolve it; all the flower of my material having been expended on the first attempt and the fall work of 1893. I had, however, seen my way clear to obtain from the material at hand such an equipment as I believed would meet our requirements.

Now practically all of my provisions were gone. To understand

how almost hopeless this loss made our projected journey seem, I will go into detail.

All of my pemmican and alcohol, the two prime essentials of Arctic sledge work under any conditions, and doubly so for ice-cap work, were lost. All my compressed pea soup, which on the previous journeys had proved such a valuable adjunct of the pemmican, was gone. Nearly all my biscuit and milk ditto. Of one thing only had I an ample supply still left, compressed tea.

What should I, what could I do? and yet the idea of abandoning the journey even in the face of this apparently overwhelming disaster, never for a moment occurred to me, nor I think to either of my companions. It would be necessary to revert to first principles as to our rations, revise our programme, and then leave the result to the Almighty.

An account of stock at the Lodge showed the following as regards rations:

Raw, frozen venison for ourselves, and frozen walrus meat for our dogs must take the place of pemmican; and coal oil must serve as a substitute for alcohol.

We could make out full rations of tea, biscuit, oil, and meat, as above for ourselves and dogs for two months, *i.e.*, sufficient for the journey to and from Independence Bay under favorable circumstances; and have some tea, biscuit, and oil, still remaining for use beyond that point.

For dog food and our own meat rations beyond that point our entire dependence must be upon the country beyond the ice-cap.

I had on the previous expedition demonstrated that one pound of pemmican per dog and three-fourths pound per man per diem would keep both in good working condition. The values of walrus meat and venison for such work were unknown quantities, though unquestionably much inferior to pemmican, yet I felt that we stood at least an even chance of reaching Independence Bay, and that chance we would take. Beyond there everything would depend upon circumstances, and by a favorable combination of these we might yet accomplish something.

Heavily handicapped at best, my chances for accomplishing anything beyond Independence Bay depending entirely upon the most fortuitous combination of circumstances, my haunting fear was that something would happen to prevent our even starting from the Lodge. Had the problem before us been merely the passing of the winter in comfort and safety I should not have had a care. As it was, my favorite nightmare during the winter was to dream that I

was back home again without having been able to make another attack upon the ice-cap, and I would waken with a feeling of positive relief to find myself stretched on my bearskin with the howling wind of the great night tearing at the house, and to realize that I still had the struggle before me. That I had reason for this fear will be understood from our utter lack of any margin for accidents or mishaps, either to ourselves, our material or our supplies.

Should the dog madness descend upon the dogs it would end everything completely; should I happen to be disabled it would result in the same way. Should Lee or Henson meet with an accident or be taken ill and die (and we had no doctor) it would be a crushing blow. Should the house catch fire and our material or scant sledge supplies be destroyed it would cripple us.

And I had reason for these fears. Lee came home from an October surveying trip so used up that it took weeks to get him in shape again. Matt entered the New Year with an attack which here would have been called the grip, and I, going out to lash down a sledge in one of the furious winter blizzards, was nearly brained by a heavy box of frozen meat which, blown from the roof, just grazed my temple and struck a glancing blow upon my arm, rendering it useless for a week. I should have liked to put my comrades in fire and burglar proof safes and had them fed with a spoon, until the day arrived to start upon the ice. This was impossible, however, and instead we travelled as much as we could, utilizing each of the three winter moons for this purpose.

During the December moon Lee and myself went to Cape York, leaving the Lodge on the 10th and returning on the 24th. During this sledge trip, made in the depth of the Arctic night, we experienced no serious discomfort except during the last return march, when we travelled for 46 hours without food or sleep and were in no special danger except for a few moments while rounding Cape Parry, when a big berg capsized, breaking the ice about me, and I narrowly escaped being engulfed with my team.

One of the main objects of the trip was to determine accurately the positions of the prominent points of this coast, as Capes Parry, Athol, York, Conical Rock, etc., etc., but the frozen condensation from the North Water, which was steaming like a huge black cauldron, shrouded the coast in a silvery veil and rendered the stars invisible most of the time. After the sun returned in the middle of February, one of us was in the field all the time, Lee continuing his traverse survey of the shores of Whale Sound and its tributaries,

Matt hunting, and myself visiting the settlements and obtaining dogs and other articles necessary to complete our equipment.

At last the day arrived to which I had looked forward and for which I had planned so long, the day set for the departure upon the journey across the "great ice."

What a striking illustration of the law of the failure of reality to equal expectation! Though at last in the position for which I had so long worked, I was terribly handicapped. Equipment and rations were both make-shifts, devised to the best of my ability from the scant means at my command, and many times when at work upon them was I reminded of Robinson Crusoe devising his boat and its simple fittings from material ill-suited to the purpose. I was, however, better off in equipment than in provisions.

Experience and ingenuity could make up for deficiencies in the former, but nothing could take the place of the alcohol, pemmican, and pea soup. So heavy was this handicap that it more than made up for our perfect training and fitness, and our complete experience.

And here let me correct an impression which I have found current in some quarters in regard to the loss of my caches which caused this heavy handicap.

It has been assumed by some that my caches were lost because I failed to properly determine their position. The actual fact was that my caches were completely submerged in an almost inconceivable deposit of nine feet of snow on a level, which left absolutely no vestige of them above its surface. The one cache which was found had been dug out of the snow during the summer and the pole marking its position reset.

This cache was 42 miles from the Moraine, and the circumstances attending its recovery were interesting.

When I reached the point where, according to my reckoning, the cache was located, I stopped the sledges and sent my Eskimos out with their dogs to quarter the surface of the snow-plain in every direction in search of trace of it. In less than five minutes a sharp-eyed, keen-scented dog made a dash at an almost invisible spot on the snow, which proved to be about three inches of the top of the signal pole still projecting from the surface, but rendered invisible from every direction but one by a tiny drift. It was within one hundred yards of where I had stopped my sledges.

The details of the march to Independence Bay and return have already been told in these pages, and it is not necessary to repeat them here.

When we started on this journey we knew that we were relying

solely upon our own exertions and the Almighty. Whatever fortune, ill or good, awaited us in or beyond the heart of the "great ice;" whatever accident or mishap befell; there would, there could be no rescuing party. And even if we returned in safety, if the trust which I reposed in my Eskimo friends was ill-founded, we might find our house and stores appropriated, and ourselves left destitute.

Those who remember my journey in 1891 will recall that on the upward march, in my effort not to make any more easting than was absolutely necessary, I was repeatedly turned from my course by the unexpected penetration of the glacier basins of the great fjords of the northwest coast of Greenland into the interior, and in this way experienced much delay and annoyance. On my return the same year I went well into the interior to avoid these obstacles. In this I succeeded. With two routes having the same starting and objective points, and enclosing between them an elongated elliptical area, it was evident that an intermediate route on my next journey would not only be somewhat shorter, but would avoid the crevasses and steep slopes of the one route and the deep soft snow of the other. This I found to be the fact, and after the experience of the upward journey I was able to modify the return route still more with the saving of a few miles and an improvement in the travelling. A comparison of the four profiles between Whale Sound and Independence Bay is very interesting and brings out the relief of the "great ice" in a very clear manner, showing that it is really a very much flattened mountain system in ice, with its main backbone, its radiant spurs, and its intermediate valleys.

The first journey was near enough to the edge of the ice to cross the great basins of exudation, if I may use the term, and their intermediate divides, and the profile shows a succession of ups and downs like those of a railroad located along the foothills of a mountain system. The profile of the return journey of the same year shows but one depression, and that in the Humboldt Basin. The profiles of the two journeys of 1895 are ideal in that they show a rapid ascent from Bowdoin Bay to the surface of the central ice mass, and then a gradual gradient along the western slope of the continental divide till the summit is reached about 180 miles from Independence Bay, when the descent is rapid to the edge of the ice. That the crest of the Greenland continental ice divide is east of the country's median line there can be no doubt. Where it is crossed on the way to Independence Bay, it is trending away to the northwest and rapidly decreasing in altitude, to lose itself in the

landward slopes of the "great ice" near the convergence of Victoria Inlet and the northwest coast.

From this continental divide extend spurs into the Cape York Peninsula, Prudhoe Land, Washington Land, Hall Land, etc., and between these divides are the enormous basins which feed the glaciers of Melville Bay, Inglefield Gulf, Kane Basin, Petermann and Sherard Osborn Fjords. The experienced navigator of the "great ice" has, like his brother of the sea, the means of avoiding or overcoming adverse conditions. If he has come in too close proximity to the land, and finds himself among the rocks and breakers—*i. e.*, crevasses and steep blue ice slopes—he must put to sea at once—*i. e.*, swerve into the interior.

If, when well out to sea, he encounters continuous adverse winds and currents and heavy sea—*i. e.*, up grade and deep soft snow—he can avoid them by veering toward the shore, when he will at once reduce the grade, and in a short time reach hard going.

One thing very much in favor of the navigator across the northern inland ice of Greenland is the fact that he will encounter practically no head winds. The regularity of the winds of the "great ice" of Greenland, as I have found them during an actual sojourn of over seven months upon the "ice-cap," and visits to it of greater or less duration in every month of the year, is phenomenal. Except during atmospheric disturbances of exceptional magnitude, which cause storms to sweep across the country against all ordinary rules, the direction of the wind of the "great ice" of Greenland is invariably radial from the centre outward, perpendicular to the nearest part of the coast land ribbon. So steady is this wind, and so closely does it adhere to this perpendicularity, that I can liken it only to the flow of a sheet of water descending the slopes from the central interior dome to the coast. The direction of the nearest land is always easily determinable in this way; the neighborhood of great fjords is always indicated by a change in the wind's direction; and the crossing of a divide, by an area of calm or variable winds, followed by winds in another direction, independent of any indications of the barometer.

The opinion previously formed by me, that the wind with its transporting effect upon the loose snow of the ice-cap must be counted as one of the most potent factors in preventing the increase in height of the ice-cap, a factor equal perhaps to the combined effects of evaporation, littoral and sub-glacial melting, and glacial discharge, has been corroborated and greatly strengthened by my observations of the past two years. When it is remembered that

the flow of the atmosphere from the cold heights of the interior ice-cap to the lower land of the coast is going on throughout the year with greater or less intensity, and that a fine sheet of snow is being thus carried beyond the ice-cap to the ice-free land at every foot of the periphery of the ice-cap, it will perhaps be seen that the above assumption is not excessive. I feel confident that an investigation of the actual amount of this transfer of snow by the wind is well worth the attention of all glacialists.

The land clouds of the Independence Bay region were visible at least one hundred miles in upon the ice-cap, gradually rising above the snow horizon as we approached. When we reached what might be called the actual crest of the ice-cap, a point about fifteen miles from the edge, where it begins to slope down rapidly to the land, and I could make out the familiar land-marks, I found that we were approaching the land on a course about five miles east of that on which I had descended to it in '92. This difference of position resulted in a higher elevation, enabling me to look over the eastern edge of the Academy Glacier Basin and make out the summits of the east coast land ribbon considerably farther to the south than I had seen them in '92. At this time it was entirely clear on the ice-cap and along the inner edge of the Independence Bay land. Farther out was a heavy, hazy stratum, hanging at a considerable elevation over the land, beneath which I saw due north of us, and distant apparently seventy-five or one hundred miles, what had escaped observation owing to the heavy clouds on my previous trip, a magnificent mountain, massive in form and heavily buttressed, towering in savage grandeur far above the intervening cliffs and ice-caps. Apparently it was twice their height; as, however, its shape was changing under the mirage effects of these high latitudes, it is very likely that its elevation was exaggerated by the same cause. Increasing haziness soon hid it from our view, a few hours later a dull veil formed, entirely blotting out the sky, clouds sank in great leaden masses on to the land, the ice-cap took on a ghastly hue, and short, sharp gusts of wind followed each other in rapid succession down the slopes of the "great ice," and the land was reached in the midst of a roaring blizzard from the ice-cap which confined us upon the moraine for two days.

In 1892 my route from the moraine to Navy Cliff had been selected with a view to giving me as good an outlook as possible, and I had travelled intentionally along the crest of the mountains which bound the Academy Glacier on the west. Now my chief object was to get the sledges to the bay ice by the easiest practicable

route, and this meant following the valleys of the streams, where the greatest amount of snow was to be found and the grade certain to be more regular and gradual. For this reason during our work upon the Independence Bay land, hunting the musk ox and transporting the sledges and equipment to a point about ten miles north of Navy Cliff, we saw only the slopes of the valleys which formed our road. When the unpleasant fact dawned upon me that our efforts had practically been futile, and that it would be folly to proceed farther, I ascended with some difficulty to the nearest eminence to see if I could make out anything more in regard to the features of the region. Where I stood, and from there east and north-east out through the Bay, the sun was shining brightly on the unbroken expanse. From my more advanced position I could see several miles of the south shore of the Bay, a land of precipitous black cliffs trending eastward from the Cape which confined Academy Glacier on the east. Westward, north-westward and northward heavy clouds were rolling across the summits of the land from the west. The shore bluffs reached away first north and then north-east, interrupted by the two inlets which I saw in '92, until they vanished in the north-eastern distance.

The face of the Academy Glacier was advanced considerably beyond its position in '92; the surface of the Bay was smooth except for the *sastrugi* caused by the violent winds which undoubtedly rush down from the ice-cap and out of this Bay, as they do out of Whale Sound, and there were but two or three bergs in the Bay away from the immediate face of the glacier. A large tidal crack ran northward from the Cape east of the Academy Glacier.

As to the character of the northern land-ribbon in the vicinity of Independence Bay, paradoxical as it may sound, its appearance, as seen from the heights of the ice-cap, was much less forbidding than that of the Whale Sound ribbon seen under the same circumstances. This I judge to be principally the result of local orographical features, but partly also due to the reversion of the point of view.

The northern shores of Whale Sound are almost continuously bold, and the plateau above the cliffs is almost completely covered either by tongues of the main Inland Ice, as in the peninsula between Bowdoin Bay and Inglefield Gulf, or by detached ice-caps as on Redcliffe Peninsula, Herbert Island, etc., the edges of which in many places are less than a mile from the shore line. As a result the traveller, descending from the heights of the "great ice," sees only the rolling snow-domes of these tongues and isolated caps,

with the crests of the black cliffs intersecting them in irregular lines, until he has almost reached the edge of the ice, and is able to look down into the bays and see the warm but contracted slopes along their shores and the little valleys at their heads.

The Independence Bay land on the contrary is, though elevated, rolling and devoid of ice-cap, and broad areas of the red and dark-brown land surface meet the eye.

Another thing in favor of this region is that it is approached from the front, as it were—*i. e.*, from the south—while the other is approached from the back, or the north.

The geological features of the country are practically the same as those of Whale Sound and nearly, if not every, feature of the one region could be duplicated in the other. The lateral moraine of the "great ice" at Independence Bay contains the same rocks and has the same appearance as that at Bowdoin Bay; the level tops of the high mountains and ridges show the same hard, compacted gravel surface (as if formed by a heavy road-roller) that can be seen on the Redcliffe Plateau back of Cape Cleveland; the eastern slopes of Heilprin Land remind me very strongly of the southeastern shore of McCormick Bay; and the giant cliffs which tower over the Academy Glacier, though much higher, resemble strongly those in Academy Bay.

Dark granite and gneissose cliffs and trap dykes, running in various directions, may be seen here as about Whale Sound.

Wave-marked slabs of red sandstone, identical in color and size of markings to those which I have picked up on the shore of Bowdoin Bay, I saw over 3,000 feet above the sea on the Independence Bay land.

The country east of the Academy Glacier, with the dark cliffs surcharged with a continuous ice-dome, would, but for the absence of exuding glaciers, be strikingly similar to the shore of Whale Sound, between Ittibloo and Netiulumi, while the Independence Bay peninsula proper resembled the country between Inglefield Gulf and Orluks Bay. In fact, the whole country seemed familiar, but with an increased barrenness, savageness and sombreness, as might be expected from four additional degrees of latitude.

Yet again, paradoxical as it may seem, I was struck by the greater abundance of flowing water not only on the land, but along the edge of the ice-cap, in this latitude as compared with Whale Sound.

In 1892 the zone of wastage along the northern edge of the ice-cap was as wide as it was at McCormick Bay, and much wider than

it was either season at Bowdoin Bay. And in 1895 the slopes of the "great ice" for several miles in from the moraine at Independence Bay, were free from snow and showed only hard blue ice, while at Bowdoin Bay the deep snow lay even partly over the moraine.

The Academy Glacier, while showing in its upper portion and around the circumference of its great névé basin, features similar to those of the glaciers of Jacobshavn and Tossukatak in Disco Bay, and the Heilprin and Tracy glaciers in Inglefield Gulf, in its lower portion showed peculiar features like those noted by Dr. Copping in the Petermann Glacier.

For several miles from the extremity of the glacier the ice-stream is intersected by great vertical-walled canals, in which the water has frozen many feet below the glacier surface. As may be imagined, the discharge of the glacier is controlled by these canals, and instead of fragments of ice and icebergs, as we understand them, great fields of the glacier, miles in extent, are detached and gradually move out into the bay.

The uniformly smooth surface of the bay ice might be accounted for in two ways, either on the assumption that the ice did not break up every year and that the combined effects of partial surface melting in summer, and the drifting snow of spring and fall, would smooth all irregularities; or that it does break up and the moment it is loosened, is driven out to sea by the wind which is always blowing out of the bay. The absence of icebergs in the bay both seasons, except near the end of the glacier, inclines me to the latter idea.

The wide tide crack seen extending northward from the Cape east of Academy Glacier both years; and the mottled appearance of the bay ice in the summer of '92, strengthens this belief.

Small lakes and ponds are numerous over the land and rushing brooks in summer time are everywhere. The presence of nearly continuous sharply marked tumuli and embankments of moraine material, miles in advance of the present edge of the "great ice," indicate more clearly than I have noticed anywhere to the south, the undoubted retreat of the ice from a considerable area of terrene.

The details of our return journey from Independence Bay, like those of the upward journey, have already been given in these pages, and it is not necessary to go over them again. Somewhat recuperated by the liberal rations of musk ox meat, men and dogs fortunately started on the return journey in fairly good condition, and were thus enabled to make the ascent of nearly 8,000 feet to the

crest of the "great ice." From this point on, a practically level surface, the absence of storms, the perfection of our equipment, and the use of every expedient known to the Eskimo, or which our own ingenuity could devise, to decrease the friction of our sledges and increase the tractive force of ourselves and dogs, enabled us to travel at speeds from $1\frac{1}{2}$ to 2 miles per hour and to continue these speeds from ten to twelve hours at a time, depending upon the character of the snow. Any sudden or increased exertion, however, would invariably be followed by bleeding at the nose, and a weakness which would compel us to stop and rest. Fortunately for us no ice-cap blizzard occurred during the return march, and we eventually reached the Lodge with all our provisions consumed and one dog out of the forty-one with which we started at the beginning. While this journey cannot be said to have added much to the information gained during the previous trip of '92, it has completed the conquest of the inland ice, and has shown that with the proper supplies and the right kind of men, Greenland can be crossed with safety at any point in a single summer.

Had the discoveries of the first journey across the ice-cap from Whale Sound to Independence Bay been combined with the perseverance and the determination under the most serious handicaps of the second journey, the result would I believe have made the work *facile princeps* among all Arctic journeys.

After we had recovered from the strain of the journey and while waiting for the arrival of the ship, some more work of surveying was accomplished and additional material obtained for the chart of Whale Sound, which accompanies this paper.

This chart is an accurate representation in considerable detail of one of the most interesting of Arctic inlets.

Primary points on it have been determined by astronomical observations, secondary ones by triangulation, and the connecting shore lines run in by an odometer and railroad compass traverse.

Several changes have been made in the contours of shore lines, positions of islands, etc., between Cape York and Cape Alexander, which will be given after my photographic records have been collated.

Material has also been obtained for an interesting chart of the entire region with the native nomenclature.

Other interesting items of work in the Whale Sound region are the determination of the rate of motion of one of the larger glaciers; photographic studies of glaciers, consisting of series of photos of each glacier from the same point covering a period of

three years; and the use for the first time, as far as I know, of the barograph and thermograph in Arctic work, by which very interesting sheets of continuous records have been obtained.

The visit of my ship to Jones Sound on the homeward voyage showed discrepancies between charts and actual coast, but the stay of the ship was so short that I have not felt justified in changing existing charts, though the discrepancies are evident to the most superficial eye.

Among other things which I believe my work in North Greenland has established conclusively are; that sledge journeys may be undertaken and carried out by Europeans with safety at any period of the Arctic night; that Europeans can remain in those latitudes for an indefinite time without being troubled by that ancient dread of Arctic explorers—scurvy; that small parties are the only ones suited for effective work in the Arctic regions; that the “great ice” of Greenland is beyond a doubt an unbroken deposit covering the entire interior from north to south and from east to west; and that the mainland mass of Greenland ends between the 82° and 83° parallels, while beyond that is an archipelago of uncertain extent reaching to the northward and north-eastward.

In my various expeditions I have introduced for the first time and determined the feasibility of numbers of novel features of pronounced value to the practical explorer; as, for example, the design for winter quarters; the use of the odometer, the barograph and thermograph, the discarding of the hitherto indispensable sleeping bag.

I believe my methods and equipment especially adapted for Antarctic work as well as Arctic work.

The studies of sledge construction and the designs for clothing have been carried to exhaustive lengths.

Finally I feel that I am justified in considering myself responsible for this last renaissance of Arctic interest, which started by my efforts of five years ago is still increasing in volume and intensity; and for the practical demonstration of the fact that Arctic exploration can be prosecuted upon a very economical basis, and *without loss of life*.